Gained in translation

Trainer to aid intelligence analysts

By Jack Weible

Military intelligence units in Iraq contending with the long-standing problem of not speaking the local tongue may soon have a new training tool to prepare for encounters on the dangerous streets of Baghdad or Fallujah.

The U.S Army's Program Executive Office for Simulation, Training and Instrumentation (PEO STRI) is developing, in consort with General Dynamics' C4 Systems, a human intelligence control cell that allows intelligence personnel to speak with virtual people in a manner that tailors the conversations to the regions they are in or will be deployed to soon. The system — actually a subsystem of the Army's Intelligence and Electronic Warfare Tactical Proficiency Trainer (IEWTPT) being fielded to support military intelligence units at corps level and below — started development at General Dynamics offices in Orlando, Fla., last summer and will begin testing soon, said Linda Morris, project director for IEWTPT at PEO STRI.

"We'll be using soldiers from the [U.S. Army] Intelligence Center itself for the evaluation," Morris said. "They'll sit with the engineers and ask questions, stress the system, try to fool it and speak with different accents. It's just a thorough ranking of the system."

Once tested, the cell will be fielded this summer, first in July at Fort Huachuca, Ariz., Morris said, and from there to Fort Hood, Texas; Fort Lewis, Wash.; and Hawaii. For now, one cell at each location will be used in training.

The human intelligence control cell, or HCC, derives from research at the University of Southern California's Institute for Creative Technologies. While the institute labeled it an interrogation system, "we had some issues with that, and that's why we call it 'tactical questioning,' " said Robert Gomez, lead systems engineer for the IEWTPT program. PEO STRI pulled the technology from the institute and is providing it as government-furnished information to General Dynamics, which in turn is enhancing the technology and imposing security standards on it.

The HCC was unveiled at December's annual Interservice/Industry Training, Simulation and Education Conference in Orlando, six months after PEO STRI and General Dynamics began work. "That shows how far we've come," Gomez said.

The HCC, which is designed to comprise the latest advancements in speech recognition, speech synthesis and artificial intelligence, operates like this:

The collector of the human intelligence, likely a soldier in the military intelligence field, interacts with a life-size 3-D character avatar — a virtual human who in real life might be an Iraqi civilian reluctant to provide information about a recent IED explosion he witnessed. The avatar is rendered by a commercial off-the-shelf video game engine and displayed by a rear-profection system onto a 100-inch portable screen. Using just a mouse and a microphone, the collector engages in a free-flowing conversation with the virtual human, and that conversation is then converted to text using speech recognition.

The virtual interpreter standing alongside the virtual human then translates the statement, and the artificial intelligence component analyzes the statement and determines a response, which is then outputted from the virtual human. The virtual interpreter translates the response in English and relays it to the soldier undergoing the training in human intelligence (HumInt).

The HumInt collector gathers intelligence information from the virtual human; meanwhile, a nearby instructor monitors his performance. After the tactical questioning is completed, the student reviews an after-action statistical review and hears comments from the instructor.

GENERAL DYNAMICS

A virtual Iraqi civilian and an interpreter will train U.S. Army soldiers for intelligence-collection duty.

EXPANDABLE LANGUAGES

At present, the HCC can operate in Arabic as well as German. But Gomez said, "We are designing it to be data-driven. So if we want to change cultures, it will be as simple as developing the database that's associated with that particular culture and then loading that database. For one scenario, you could have an Iraqi, then the next one could be someone from Afghanistan."

The HCC's biggest attribute is that it allows military intelligence personnel to train using the languages spoken in a real-world environment. At present, there is nothing at that level of training, according to Morris, who said soldiers being schooled in the intelligence field at Fort Huachuca lack that vital training.

"For quite a few of these soldiers, they get done with school and they're immediately being deployed," Morris said. The soldiers never see a translator until they're overseas.

General Dynamics used the commercial video game "Far Cry," published by Ubisoft, to drive the graphics for the HCC, but is also building the HCC to be modular so that, Gomez said, if "Far Cry" updates fall short, "we can break in a new game that will be more powerful, give us better graphics and better capabilities."

The HCC can run in standalone mode or integrated mode with the IEWTPT's technical control cell and a constructive simulation.

Existing technology limitations in using artificial intelligence and speech recognition also extend to the HCC, Gomez said, citing the audio-to-text component, "which is basically when I speak, the computer hears it and converts it to text. That text is then analyzed by what we call a statistical qualifier, which is [the technology provided by the Institute for Creative Technologies].

"That qualifier would be able to pick out specific words and say, 'OK, this is what is being asked and this is the proper answer.' That answer right now is, we have to train it. So if it's any specific question, we have to train the qualifier to know which answer to reply."

PEO STRI and General Dynamics plan to expand the control cell's capabilities to allow the virtual human to respond with different answers to his goals, beliefs and emotional state, such as anger or nervousness. That is lacking for now, Gomez said.

"We're going to try and bring in some tracking mechanism for the avatar to track the soldier when they're walking back and forth, to try and have eye contact, which is important.

"When you bring in some of those humanistic behaviors, it will affect how your questions are going to be answered. That's part of some of the technologies we're going up against because it's really cutting edge," he said.

Feedback from the troops who have tested the HCC has been "phenomenal," Morris said. "They just can't wait to get it in the field." While the technology is targeted at military intelligence troops for now, there is no reason it couldn't be expanded to other job classifications, she said.

"This is a sustainment trainer," Morris said. "This is not initial entry training capability. They'll be able to use it if their team is being deployed and they can use the trainer right before they go." ■